REVISIONAL NOTES ON THE GENUS *ANTANARTIA* (LEPIDOPTERA : NYMPHALIDAE)

BY

T. G. HOWARTH

British Museum (Natural History)

Pp. 21–43 ; 21 *Text-figures*, 5 *Plates*

BULLETIN OF
THE BRITISH MUSEUM (NATURAL HISTORY)
ENTOMOLOGY Vol. 18. No. 2
LONDON: 1966

THE BULLETIN OF THE BRITISH MUSEUM (NATURAL HISTORY), *instituted in* 1949, *is issued in five series corresponding to the Departments of the Museum, and an Historical series.*

Parts will appear at irregular intervals as they become ready. Volumes will contain about three or four hundred pages, and will not necessarily be completed within one calendar year.

In 1965 *a separate supplementary series of longer papers was instituted, numbered serially for each Department.*

This paper is Vol. 18, *No.* 2 *of the Entomological series. The abbreviated titles of periodicals cited follow those of the World List of Scientific Periodicals.*

TRUSTEES OF
THE BRITISH MUSEUM (NATURAL HISTORY)

Issued 21 *June,* 1966 *Price* £1 6*s.*

REVISIONAL NOTES ON THE GENUS *ANTANARTIA* (LEPIDOPTERA : NYMPHALIDAE)

By T. G. HOWARTH

CONTENTS

	Page
Introduction	23
Key to Species, Subspecies and Forms	25
Descriptions	26
Abnormal Scaling	36
Parallel Modification	37
Acknowledgements	38
References	38

SYNOPSIS

In the present paper one new species, consisting of four subspecies, is described together with four new subspecies and a possible interspecific hybrid. One name has been synonymized and attention is also drawn to the existence of two clines. All the known species and subspecies are figured together with figures of the male and female genitalia, and a key to the species, subspecies and forms is given. Notes on scale defects and parallel modification are also given.

INTRODUCTION

The genus *Antanartia* Rothschild & Jordan (1903 : 508) (Type : *delius* Drury) was erected to include the five African, Malagasy and Mascarene species which were originally placed in *Hypanartia* Hübner, which now contains only New World species. The species of *Antanartia* inhabit Africa from Sierra Leone through the West Coast to Ethiopia, southwards to Cape Province and then eastwards to the Comoro Islands, Madagascar and the islands of Réunion and Mauritius. In the tropics most of the species are montane in habit, preferring altitudes of between 3,000 and 13,000 feet.

The present investigation was begun when some material was sent to the Department of Entomology, British Museum (Natural History) for determination and it was realized that there were several previously unrecognized subspecies present amongst the museum material. In the course of this investigation all the characters mentioned by Rothschild & Jordan were examined with a view to placing the species in a more natural phylogenetic order than that given by Aurivillius (in Seitz, 1913).

When Rothschild & Jordan separated *Antanartia* from *Hypanartia* one of the characters they mentioned was the presence, in the male of *Hypanartia*, of a mesial hook on the eighth abdominal tergite. This structure, named the superuncus by Kusnezov in 1915, is unusual in Rhopalocera but it is extremely well developed in

Hypanartia. In *Antanartia* there are several characters present that are not in the American genus. In *Antanartia*, the uncus is slightly bifurcate, but not deeply channeled as in *Hypanartia* and the brachia below it are well developed. The valvae are unusual in that they possess an inner and outer harpe, the latter, arising basad of the outer margin, is a massive structure strongly armoured with large teeth and spines. It is held in position by an outer flange of the cucullus and a lobe or lobes along the costal or dorsal edge of the valva. The flange and lobes have numerous strong setae which help to retain the harpe in position. In one species, *abyssinica* (Felder), the outer harpe is Y-shaped with the apex widely bifurcated. In some cases the aedeagus has two barbs ventrally towards the tip and in others these are absent. The saccus is reduced or absent and the vinculum is produced ventrally and posteriorly so that the whole genitalia lie well within the body cavity when at rest.

The female genitalia are unusual in that they have the sterigma or intersegmental membranes of the abdominal sternites adjacent to the ostium heavily chitinized and in the form of pouches. It seems probable that these have been developed to prevent the accidental rupture of the abdominal wall by the heavily armoured harpes of the male during copulation.

In both sexes the genitalia can be divided into two groups of three species, those that have the barbed aedeagus in the male together with those without the signa on the ostium bursa of the female, namely *delius* (Drury), *schaeneia* (Trimen) and *borbonica* (Oberthür), and those that have an unbarbed aedeagus in the male and a well-developed signa in the female, namely *hippomene* (Hübner), the newly described *dimorphica* and *abyssinica* (Felder).

Rothschild & Jordan when dealing with *dimorphica* sp. n. (as *hippomene* Hübner), *schaeneia* (Trimen) and *abyssinica* (Felder) drew attention to the variation in the small area of modified scales situated on the underside of the fore wing near the base of space 1a in both sexes. This character, like the genitalic characters mentioned above, tends to illustrate the same specific relationships so that the six species divide into two, the *delius* group and the *hippomene* group of species. In the first the specialized scale area is confined to space 1a by the vein 1a but in the second it extends beyond the vein into space 1b above it, though *abyssinica* (Felder), being more variable, tends to link the two groups.

The critical areas of the venation in the genus are situated in the apical area of the discoidal cell of the fore wing and in the area of veins 3 and 4 of the hind wing and these have been figured for each species. Further remarks on the aberrant nature of the venation of *Antanartia borbonica* (Oberthür) may be found under that species (p. 30).

All the type material is in the British Museum (Natural History) except where otherwise stated.

In the descriptions the length of the fore wing is measured from the base to the apex and where two measurements are given, these denote the smallest and largest specimens in the series. In order to save unnecessary repetition when there is a long series of paratypes only the more important data i.e., the locality, altitude and date are given with an overall figure for the country concerned.

Key to the Species, Subspecies and Forms of *ANTANARTIA*, Based on the Wing Markings

1		Upperside fore wing with no clearly defined yellow/red transverse band from mid-costa to near tornus 2
–		Upperside fore wing with clearly defined transverse band 5
2	(1)	Upperside hind wing pale discal area not suffused with dark red or brown . 3
–		Upperside hind wing pale discal area suffused with dark red or brown . . 4
3	(2)	Upperside fore wing cell not darkened beyond central bar . ***delius delius*** (p. 26)
–		Upperside fore wing cell darkened beyond central bar ***delius delius*** f. ***nigrescens*** (p. 27)
4	(2)	Underside fore wing transverse area pale . . . ***delius guineensis*** (p. 27)
–		Underside fore wing transverse area dark, red-brown or brown ***delius delius*** f. ***amauroptera*** (p. 27)
5	(1)	Hing wing with no tail at vein 4 6
–		Hind wing with tail at vein 4 8
6	(5)	Upperside fore wing cell bar broken and darker than base ***abyssinica vansomereni*** (p. 31)
–		Upperside fore wing cell bar not broken and not darker than base . . . 7
7	(8)	Upperside hind wing ocellus in space 2 smaller than those in 3 and 4, often blind, marginal band abruptly broader in space 5 ***abyssinica abyssinica*** (p. 31)
–		Upperside hind wing ocelli in spaces 2–4 more equal, that in 2 with pupil, marginal band gradually widened in space 5 . . ***abyssinica jacksoni*** (p. 31)
8	(5)	Upperside hind wing with well defined post discal black line 9
–		Upperside hind wing without post discal line 11
9	(8)	Upperside hind wing band narrow and divided by dark interneural lines, ♀ upperside fore wing transverse band cream . . . ***schaeneia diluta*** (p. 29)
–		Upperside hind wing band wider and interneural lines inconspicuous, ♀ upperside fore wing transverse band not cream 10
10	(9)	Underside fore wing inner edge of transverse band stepped at vein 2 and not at vein 1 . . . . . ***schaeneia schaeneia*** (p. 28)
—		Underside fore wing inner edge of transverse band not stepped at vein 2 but stepped at vein 1 . . . . . ***schaeneia dubia*** (p. 29)
11	(8)	Underside fore wing with broad violet submarginal line from vein 6 to tornus . 12
—		Underside fore wing without violet submarginal line 13
12	(11)	Upperside fore wing post discal spots in spaces 5 and 6 white ***borbonica borbonica*** (p. 30)
—		Upperside fore wing post discal spots in spaces 5 and 6 suffused with orange ***borbonica mauritiana*** (p. 30)
13	(11)	Underside fore wing basal cell markings outlined in bluish white or cream . 14
—		Underside fore wing basal cell markings outlined in brown or red . . . 15
14	(13)	Hind wing tail at vein 4 short (± 3 mm.) and broad. Upperside bands ochre ***hippomene hippomene*** (p. 32)
—		Hind wing tail at vein 4 long (± 4 mm.) and thin. Upperside bands orange ***hippomene madegassorum*** (p. 33)
15	(13)	Upperside bands orange-ochre 16
—		Upperside bands deep reddish orange . . . ***dimorphica mortoni*** (p. 36)
16	(15)	Upperside hind wing inner black marginal line not terminating at vein 3 . . 17
—		Upperside hind wing inner black marginal line terminating at vein 3 ***dimorphica comoroica*** (p. 35)
17	(16)	Upperside hind wing with dark submarginal spots or ocelli in spaces 4–6 ***dimorphica aethiopica*** (p. 35)
—		Upperside hind wing with no dark submarginal spots in spaces 4–6 ***dimorphica dimorphica*** (p. 33)

The *DELIUS* Group

Antanartia delius delius (Drury)

(Pl. 1, figs. 1, 2, 3, 4 and 5. Text-figs. 1, 8 and 15)

Papilio Nymphalis Phaleratus delius Drury, 1782 : 18, pl. 14, figs. 5, 6.
Papilio Eurocilia Fabricius, 1793 : 79, No. 247.
Vanessa Demonica Godart, 1819 : 301, No. 14.
Antanartia delius f. *kamitugensis* Dufrane, 1945 : 99 **syn. n.**

This, the type-species of the genus, is also the most variable and ranges from Sierra Leone in the west, to Uganda, Kenya and Tanzania in the east. When arranging the long series in the collection of the British Museum (Natural History) according to distribution, it was noticed that specimens from the eastern part of the range differed from those from further west and it was at first thought that the former might well represent an undescribed subspecies. However it was found that Dufrane (1945) had already separated a male specimen from the rather intermediate area of Kivu and named it *kamitugensis*, which necessitated a closer examination to determine the limits of these two forms or races and it was discovered that a rather ill-defined cline rather than two distinct races was involved. Prior to this, all the specimens had been measured and averaged and the results are given in the following Table.

Fore Wing Length from Base to Apex in Millimetres

	Males			Females		
	Max.	Min.	Average	Max.	Min.	Average
W. Africa						
Sierra Leone—Congo . . 104 ♂, 35 ♀	34	24	28·3	36	26	32·8
E. Africa						
Uganda—Tanzania . . 72 ♂, 22 ♀	30	23	26·5	30	23	29

It will be seen from these that there is a marked difference in size from west to east. The western specimens have, on the upperside of the fore wing, the subapical and submarginal series of white spots usually well developed. On the underside of the fore wing the blind pupil of the indistinct ocellus in the discal area of spaces 1a and 1b is broadly edged with bluish white, the transverse discal area is yellowish and the basal cell spot often has no red-brown pupil and the red-brown centre of the central cell bar tapers and does not usually reach the median vein. The specimens from Uganda and further east are generally smaller and darker and usually lack the white subapical spots on the fore wing upperside except that in space 4 which is usually present. On the underside of the fore wing the basal cell spot has a distinct reddish pupil and the central cell bar is broadly divided with the same colour. The discal markings towards the hind margin in spaces 1a and 1b are more distinct and usually reach vein 2, the outer and inner lines are more yellow and the yellowish transverse discal area is often suffused with orange at the base of space 2 and the adjoining

interspaces. There is a great deal of individual variation throughout this insect's range, the males being usually darker than the females. On the upperside of the fore wing, specimens frequently have the dark basal markings of the first interspace suffused with brown which extends beyond half-way to the tornus and into the cell and adjacent interspaces, sometimes even obscuring the black cell markings and coalescing with the black apical area. An extreme example of this type of variation is form *nigrescens* Suffert (1904 : 108) in which the fore wing is suffused with blackish brown with only a half crescent of orange present in the discal area from the inner margin to vein 3. On the hind wing upperside the black basal suffusion is almost confluent with the black discocellular bar. On the underside of both wings the markings are not noticeably darkened. In Uganda a different type of variation occurs and affects the paler markings of both wing surfaces. In form *amauroptera* Sharpe (1904 : 181) (Pl. 1, fig. 5) the yellowish orange markings of the upperside of both wings and the underside of the fore wing are darkened to a deep brownish red or burgundy with the darker markings showing through, except adjacent to the costa of the mid-cell of the underside of the fore wing, where it is cream. There is another form transitional to the above in which the deep velvety red-brown of the disc of the upperside of the fore wing appears darker than the plain brown of the apical and marginal areas. There is an even more extreme form that has the whole of the upperside of both wings an almost unicolorous deep brown, with the exception of the marginal markings of the hind wing, which remain quite distinct. On the underside, the discal area of the fore wing is a dull brown and both wings, with the exception of the basal and cell bars and spots, lack the rufous tone present in form *amauroptera*.

Antanartia delius guineensis ssp. n.

(Pl. 1, figs. 6 and 7)

In general appearance this subspecies is nearer to the Ugandan specimens than to those from the West Coast mainland.

♂. *Upperside.* Fore wing length 26–30 mm. The orange-red transverse area suffused and darkened from the median vein towards the hind margin, which is the reverse of the coloration of the western mainland specimens, in which the costal area is darkened. Both series of white spots in the apical area distinct ; the red discal area of the hind wing much darkened basally, so that the black-brown discocellular bar and the costa are hardly discernible. One specimen has the whole basal area as far as the inner submarginal line a uniform brown. *Underside.* Fore wing very similar to the typical Ugandan specimens having the yellowish transverse discal area tinged with orange and the black basal markings in space 1b and the cell outlined in brilliant lilac. There is a diffuse patch of lilac beyond the cell and the inner submarginal line in spaces 3 and 4 is edged with this same colour. Hind wing markings generally more distinct and more suffused with lilac discally than in specimens from Uganda.

♀. Unknown.

Holotype ♂. FERNANDO PO (Hewitson coll.).

Paratypes ♂. 1, same data as holotype ; 1, Fernando Po (Godman-Salvin coll.) ; 1, Fernando Po (L. Frazer coll.).

Distribution. This subspecies is confined to the island of Fernando Po in the Gulf of Guinea, though there is another male which is indistinguishable from it labelled "Angola" (Grose-Smith coll. ex. Joicey Bequest) which may probably be wrongly labelled.

A probable interspecific hybrid between *Antanartia delius* (Drury) and *Antanartia schaeneia* (Trimen)

(Pl. 2, figs. 8 and 9. Text-fig. 10)

A female specimen of *Antanartia* was received from Mr. T. H. E. Jackson of Kenya which was taken at Budongo, Bunyoro, Uganda in June, 1938 by C. Cripps. On the upperside, this specimen resembles a dark example of *schaeneia* superficially, as it has the sharply defined inner margin to the transverse orange band of the fore wing and the hind wing completely brown as far as the orange margin so characteristic of *schaeneia*. The orange bands however are slightly deeper in colour and are nearer to *delius* in this respect, that of the hind wing has the dark interneural submarginal bars which both species have, though they are more prominent in *schaeneia*. In space 1b of the fore wing there is a prominent dark spot in the orange band which neither species has. On the underside however this spot is even more noticeable as it is larger and surrounded with ochre, while the remainder of the band is brownish in coloration similar to that only found in *delius* form *amauroptera* Sharp from Toro. It is interesting to note that one or two specimens of *delius* also have a trace of a spot in the above mentioned position. Apart from the coloration of the fore wing band, the underside is indistinguishable from that of *schaeneia*. *Antanartia delius* and *schaeneia* fly together in Uganda and their genitalia appear sufficiently close as not to preclude the possibility of a successful mating and as the genitalia of this specimen appear mid-way between the two species I conclude that it may possibly be the result of a feral cross between them.

Antanartia schaeneia schaeneia (Trimen)

(Pl. 2, figs. 10, 11 and 12. Text-figs. 2, 9 and 16)

Pyrameis Hippomene (Hübner) Trimen, 1862 : 121. [Misidentification from Boisduval, 1833 : 191].
Eurema schaeneia Trimen, 1879 : 329.
Hypanartia commixta Butler, 1880 : 336.

The nominate subspecies occurs in South Africa in Cape Province, Natal and as far north as Transvaal. According to Swanepoel (1953) it inhabits rain-forests, preferring the higher elevations where mists are prevalent. Specimens from still further north in Rhodesia, Zambia, Tanzania, Kenya and Uganda belong to a distinct subspecies.

Antanartia schaeneia dubia ssp. n.

(Pl. 2, figs. 13, 14 and 15)

♂. *Upperside.* Fore wing length 21–29 mm., similar to nominate subspecies but the orange transverse band slightly broader and the inner edge sometimes stepped at vein 1. Hind wing, the marginal orange band between vein 4 and apex not smudged at apex and with the submarginal shading not as distinct, particularly in spaces 4 and 5. *Underside.* Fore wing, the inner edge of pale transverse band appears slightly smoother centrally, due to the outer dark bar in space 2 barely reaching vein 2. However at vein 1 it is stepped or cut off abruptly, whereas in the nominate subspecies the dark bar in space 2 is shaded outwardly and diagonally towards the tornus and vein 1, so that the inner edge of the transverse band is straighter in this area. Hind wing, similar to ssp. *schaeneia* but slightly more rufous.

♀. As male but markings slightly broader and paler generally on both upper and underside. Fore wing length 25–30 mm.

Holotype ♂. MALAWI : Nyika, Kasungu Mt., 7,200 ft., 4.iii.96 (*R. Crawshay*).

Allotype ♀. MALAWI : Slopes of Mt. Mlanje, vi.1913 (*S. A. Neave*).

Paratypes : RÉPUBLIQUE DU CONGO, 3 ♂ : Kirisimbi Volcano, Kivu District, ix ; W. slopes of Ruwenzori, xii, 2,500 m. ; Forest 90 km. W. of Lake Albert-Edward, 1,000 m. ii. UGANDA, 36 ♂, 6 ♀ : Ruwenzori District ; E. Ruwenzori, 6–13,000 ft., ii ; W. side Bwamba Pass, 5,500–7,500 ft., xii–i ; N. Ruwenzori, 6,000–8,500 ft., xi ; Mt. Ruwenzori, 6,000–9,000 ft., ii ; Namwamba Valley, 6,500 ft., xii–i ; Fort Portal, ii ; Kigezi district, Mafuga Forest, 7,500–8,500 ft., i–ii ; Rutenga Forest, vi ; Kanaba Gap, vi ; Mt. Kokanjero, S.W. of Elgon, 6,400 ft., viii ; Subugo Forest, xii ; Kakamega Forest, Mau, xii. RWANDA, 1 ♂, 1 ♀ : Rugege Forest, Lake Kivu, 8,000 ft., xii ; Mkoko River, iv. KENYA, 82 ♂, 13 ♀ : E. Slopes Aberdare Mts., 7,000–8,500 ft., ii ; Yala River, Kakunga Forest, 4,800–5,300 ft., v ; S. Foot and slopes Mt. Elgon, 5,100–5,800 ft., vi ; Escarpment, 6,500–9,000 ft., ii, iii, xii ; Hoey's Bridge ; Meru district, Mt. Kenya, ix ; Mt. Kenya, 9,500 ft., i ; Mt. Kenya, Naro Moro, 8,000 ft., viii ; Subukia, xi; Nguru Hills ; Nyeri ; Kikuyu, Roromo ; Nairobi ; Patsho, Nandi Country, xii ; Rau, Nandi Country, ii. TANZANIA, 8 ♂, 3 ♀ : W. Kilimanjaro, 4,500–5,000 ft., xii–ii ; Mt. Kilimanjaro, Marango, ii ; Magazine Hill, v. MALAWI, 7 ♂, 12 ♀ : 3 ♂, 8 ♀, same data as allotype ; Mlanje Boma, 2,400 ft., iv–v ; Mlanje Plateau, 6,500 ft., xi ; Nyankowa Mt., W. of Lake Nyasa, 6,500 ft., iv ; Lake Shirwa, Chikala. RHODESIA, 7 ♂, 4 ♀ : 1 ♂, Umtali, iii ; 1 ♂, Laurenceville, Vumba, v ; 1 ♂, 2 ♀, Mt. Selinda, ii, v, ix ; [B.M. (N.H.)]. 1 ♂, 2 ♀, Mt. Selinda, ix ; 1 ♂, Vumba Mts, ii ; [National Museum, Nairobi]. 2 ♂, Vumba Mts, v ; [B. K. West coll.].

Distribution. This is a montane subspecies, generally inhabiting elevations over 4,000 feet in the Kivu district of the République du Congo, Uganda, Rwanda, Kenya, Tanzania, Malawi and Rhodesia.

Antanartia schaeneia diluta Rothschild & Jordan

(Pl. 3, figs. 16 and 17)

Vanessa schoeneia [sic] (Trimen) Oberthür, 1883 : 723.
Antanartia schaeneia diluta Rothschild & Jordan, 1903 : 510.

This very distinct subspecies is characterized by the normal transverse orange band of the fore wing and the marginal band of the hind wing upperside being much narrower and paler in the male and almost white in the female.

Antanartia borbonica (Oberthür)

This beautiful species, which is confined to the Mascarene Islands, is wrongly stated by Aurivillius (in Seitz, 1913 : 228) to occur also in Madagascar. Though faintly resembling the previous species or even *hippomene madegassorum* (Aurivillius) in appearance, it is in fact a very distinct species which has evolved a marked venational difference from the other members of the genus, due no doubt to the extreme isolation of its habitat. Rothschild & Jordan (1903 : 509) in their definition of the genus *Antanartia* state " The third subcostal branch of the fore wing stands, moreover, much farther from the cell than in *Hypanartia*, The cell of the hind wing is closed, the cross-vein standing distally of the point of the origin of M^1, while it is placed opposite M^1 or proximally of it in *Hypanartia dione*, *kefersteini*, *lindigi* etc." The first part of this statement cannot apply to either genus as the third subcostal branch (vein 9) and also vein 10 arise near the end of the cell in all species of both *Antanartia* and *Hypanartia*, except *borbonica*, which is unique in having veins 9 and 10 on a common stalk from the cell-end. The second part, relating to the cross-vein, is only partly correct in that only *Hypanartia arcaei* (Salvin) has the vein placed proximally, with the exception of *borbonica*, which has the cross-vein standing well beyond the point of origin of veins 3 and 4. From these facts it would appear that Rothschild & Jordan based their venational characters for the genus *Antanartia* on those of *borbonica*, the one aberrant member.

Antanartia borbonica borbonica (Oberthür)

(Pl. 3, fig. 18. Text-figs. 3, 11 and 17)

Vanessa hippomene (Hübner) Boisduval, 1833 : 191, pl. 8, figs. 3, 4.
Vanessa borbonica Oberthür, 1880 : 164.

This, the nominate subspecies, is confined to the island of Réunion.

Antanartia borbonica mauritiana Manders

(Pl. 3, fig. 19)

Antanartia hippomene mauritiana Manders, 1908 : 437.
Antanartia borbonica mauritiana Manders ; Aurivillius (in Seitz), 1913 : 228.

This subspecies, which has only been taken on the island of Mauritius and which may now be extinct, is easily separable from ssp. *borbonica* by its smaller size and the orange coloration of the post-discal spots in spaces 4–6 of the upperside of the fore wing, which are white in the nominate subspecies, and the inner edge of the orange transverse band of the same wing surface, which is sinuate in *mauritiana* and straight in ssp. *borbonica*.

The *HIPPOMENE* Group

Antanartia abyssinica (Felder)

This species is the smallest of the genus and is distinguished by its lack of a tail at vein 4 on the hind wing. On examination of a long series from the whole of its known distributional areas it was noticed that there are three distinct subspecies involved.

Antanartia abyssinica abyssinica (Felder)

(Pl. 3, fig. 20. Text-figs. 4, 12 and 18)

Pyrameis abyssinica Felder, 1867 : 397, 589.

The nominate subspecies is confined to Ethiopia.

Antanartia abyssinica jacksoni ssp. n.

(Pl. 3, fig. 21)

♂, ♀. Similar to the nominate subspecies but has the submarginal ocelli of the upperside of the hind wing more equal in size and that in space 2 usually with a pupil, moreover the ochre submarginal band is not broadened so noticeably in space 5. Fore wing length ♂, 17–21 mm., ♀, 20–23 mm.

Holotype ♂. KENYA : Mt. Elgon, vii.1937 (*T. H. E. Jackson*).

Allotype ♀, same data as holotype.

Paratypes : KENYA, 60 ♂, 24 ♀ : Aberdare Mts, 7,000–9,500 ft., ii ; Mt. Elgon, 5,100–5,800 ft., vi, vii, x ; Mt. Kenya, 4,500–8,500 ft., ii, ix ; Crater Lake, N.W. of Meru, 5,000–7,000 ft., ii ; Masai Reserve, Mara River, v; Hoey's Bridge, 6,200 ft. ; Embi ; Patsho, Nandi Country, xii ; Nairobi ; Escarpment, 6,600–9,000 ft., i, ix, x, xi, xii ; Kikuyu Escarpment, Kijabe to Limoru, Uganda R., 6,800–7,400 ft., iii ; Lake Nakuru, 6,100 ft., ix ; Eldoma Ravine, iii ; Yambeni Range, Mt. Kenya Dist., 3,000 ft., xii ; Nyeri, i ; Kikuyu, Roromo. TANZANIA, 13 ♂, 4 ♀ : Old Moschi, iv ; Ngorongoro Crater, Arushu Dist., 5,800–7,800 ft., ii ; W. Shore of Lake Manyara, ii–v ; Meru, 7,000 ft., xii, ii ; W. Kilimanjaro 4,500–5,000 ft., xii–ii ; Edge of Olomoti Crater, Arushu Dist., 10,000 ft., ii.

Distribution. Apparently widely distributed in Kenya and Tanzania in suitable localities at altitudes from 3,000–10,000 feet.

Antanartia abyssinica vansomereni ssp. n.

(Pl. 3, figs. 22 and 23)

♂, ♀. Easily distinguished from the other two subspecies by the upperside of the fore wing having the orange-ochre transverse band much broader and the dark basal area more tawny, so that the black central cell-bar, which is broken in this subspecies, is more conspicuous. The marginal band of the hind wing is broader and almost encloses the distinct spots and ocelli at its inner edge. Fore wing length, ♂, 19–22 mm., ♀, 20–24 mm.

Holotype ♂. RÉPUBLIQUE DU CONGO : Upper Oso River, N.W. Kivu, 4,000 ft. Forest with some grass. ii.1924 (*T. A. Barns*).

Allotype ♀. Same data as holotype.

Paratypes: UGANDA: 7 ♂, 1 ♀, E. Ruwenzori, 5,000–13,000 ft., ii.1906 (*G. Legge & A. F. R. Wollaston*); 1 ♀, Ruwenzori, 6,000–8,000 ft. (*Scott Elliot*); 2 ♂, Toro, xi–xii.1900 (*H. B. Rattray*). RÉPUBLIQUE DU CONGO: 4 ♂, 1 ♀, Mt. Niragongwe, N. of Lake Kivu, 1900–3,000 m., ix.1907 (*R. Grauer*); 1 ♂, Karissimbi Forest, Kivu, 1919 (*T. A. Barns*); 2 ♂, Mikeno Mt., N. Kivu, x.1919 (*T. A. Barns*); 1 ♂, Bukeyei, 6,000 ft., 21.v.1926 (*F. G. Jackson*); 1 ♀, Congo, 1926 (*F. G. Jackson*); 3 ♀, Kitanga; 3 ♂, 1 ♀, Marienseen to Issawi, 1,000 m., vii.1907 (*R. Grauer*); 1 ♂, Nr. Kisenyi, N.E. Shore of Lake Kivu, 3,600–5,000 ft., vii, viii.1926 (*F. G. Jackson*). RWANDA: 3 ♂, 1 ♀, Kissenyi, Lake Kivu, x.1907 (*R. Grauer*).

Distribution. This subspecies seems confined to the Kivu and adjacent areas of the République du Congo, western Uganda and Rwanda. There is one specimen labelled " Mkoma Mt. South Urindi Dist., E. Tanganyika, T. A. Barns " the accuracy of which seems extremely doubtful, as this locality is about one thousand miles away from the headquarters of *vansomereni*. In the Ruwenzori Range it has been recorded up to 13,000 feet.

These two newly described subspecies are named after Mr. T. H. E. Jackson and Dr. V. G. L. van Someren of Kenya, both of whom have done so much for the study of African Rhopalocera.

Antanartia hippomene (Hübner)

Up to the present time *hippomene* has been thought to be a single species inhabiting the African continent from Ethiopia to South Africa and the West Cameroons area, with a subspecies in Madagascar. A closer examination of the extensive series in the British Museum (Natural History) has shown however that only the South African and Malagasy populations should be attributed to *hippomene* and that the others belong to an undescribed species with four races, one in Ethiopia, another in Central and East Africa as far south as Rhodesia and the Transvaal, another in West Cameroon, Nigeria and Fernando Po and yet another in the Comoro Islands.

Hübner's figure of this species leaves no doubt as to its identity but the brief description by Aurivillius [in Seitz, 1913 : 228, pl. 52 (d)] is of little diagnostic value and he figures the newly separated species *dimorphica* not *hippomene*. It should be pointed out that in the second line of his description the word " forewing " should read " hind wing ".

Antanartia hippomene hippomene (Hübner)

(Pl. 3, figs. 24 and 25. Text-figs. 5, 13, 19)

Hypanartia hippomene Hübner, 1823 : 2, pl. 25.
Eurema hippomene (Hübner) Trimen, 1887 : 204.
Antanartia hippomene (Hübner) Swanepoel, 1953 : 209, pl. 11, fig. 19 [in colour].

♂, ♀. Characterized by the palpi being cream ventrally with sparse black hairs situated outwardly in this area. Fore legs cream with a narrow brown stripe on the front inner surface, the long hairs of the male in this area cream. Antennal shaft brown above, whitish below and at the base of club, which is blackish brown with a reddish tip. *Upperside*. Fore wing has

outer margin sinuate and bent inwards at spaces 3 and 4, which gives the apical area a slightly falcate appearance. The yellowish ochre transverse discal band tapers sharply to a blunt point and only just touches the hind margin. There is a small white spot usually present in space 3. The coloration of the cell-base not noticeably different from the remainder of the wing base. Hind wing, black brown basal area extends along the costa to apex and into the yellow ochre marginal band along the veins, so that the inner edge of band is scalloped. The two ocelli in spaces 2 and 3 are well developed, that in space 2 tending to have a yellowish orange ring round it, which is more noticeable outwardly. The two marginal lines in the tornal area broad, the inner extending to vein 4 and joining that of the rather blunt tail. *Underside.* Fore wing, transverse discal band cream slightly tinged with orange basad, the dark basal marks in cell outlined in cream, with a small cream triangular spot at extreme base of cell. The sexes are very similar on the underside. Fore wing length ♂, 22–26 mm., ♀, 23–30 mm.

Distribution. The nominate subspecies is confined to suitable forested areas in South Africa from the Cape to the Transvaal.

Antanartia hippomene madegassorum (Aurivillius)

(Pl. 4, figs. 26 and 27)

Hypanartia hippomene var. *madegassorum* Aurivillius, 1898 : 129.

♂, ♀. Similar to ssp. *hippomene* but the antennae are reddish brown throughout, outer margins of fore and hind wings more wavy and the tails of hind wing longer and more sharply pointed. *Upperside.* Fore wing, central cell bar separated from base by small patch of orange, and transverse discal band this same colour. Hind wing marginal band also orange. *Underside.* Fore wing, ground colour darker particularly towards apex but transverse discal band ochre and not orange, as in nominate subspecies. The sexes are similar in coloration. Fore wing length ♂, 23–25 mm., ♀, 25–27 mm.

Distribution. Confined to the island of Madagascar and now believed to be extremely rare. Specimens from Beforo and S. Betseleo in British Museum (Natural History).

Antanartia dimorphica dimorphica sp. n.

(Pl. 4, figs. 28, 29, 30, 31, 32 and 33. Text-figs. 6, 14 and 20)

This species may be separated from *hippomene* by its more truncate fore wings, particularly in the female, and the deeper orange colour of the central part of the transverse band on the underside of the fore wing. The species exhibits considerable sexual dimorphism on the underside of the hind wing, the female resembling *hippomene madegassorum* in tone and the male being even darker.

♂. Palpi slightly more hirsute than *hippomene* and the black hairs longer ; fore legs browner, with brown and cream hairs inwardly, which give the leg the appearance of having a much broader stripe. *Upperside.* Fore wing, as *hippomene* but with less falcate apex and the orange transverse band not tapering to a point at hind margin. Usually without a small white spot in submargin of space 3. The base of the cell rufous-brown in contrast to the distinct black cell bar and the remaining basal coloration. Hind wing, the yellow orange marginal band extends to the apex, which is not darkened as in *hippomene*, and the inner edge generally straighter ; inner black submarginal line of tornus not often joined to black line of tail at vein 4. *Underside.* Fore wing, as *hippomene* but ground colour darker and the transverse discal band broader and orange as are the basal striae of the cell. There is no pale spot at the wing base. Hind wing, darker than *hippomene* with more of a purple gloss and the broad submarginal area has a smoother appearance.

♀. Similar to the male but wings slightly broader and the margin of hind wing slightly more wavy and the underside of hind wing considerably paler. Fore wing length ♂ 20–27 mm., ♀, 21–26 mm.

Holotype ♂. UGANDA: Ruwenzori Range, xii.1934–i.1935. B.M. E. Afr. Exp. Namwamba Valley, 8,300 ft. (*T. H. E. Jackson*).

Allotype ♀, same data as holotype but taken at 6,500 ft.

Paratypes, 1 ♂, 1 ♀ with same data as allotype. A large series of 122 ♂, 55 ♀ from the following localities and altitudes. RÉPUBLIQUE DU CONGO: Rutchuru–Kabali; Kisenyi, 3,600–5,000 ft.; S.W. Corner of L. Kivu, 6,300 ft., Karissimbi Volcano, Kivu; N.W. Lake Tanganyika, 1,700–1,900 m.; N.W. Kivu, 4,300 ft. UGANDA: E. Ruwenzori, 5,000–13,000 ft.; N. Ruwenzori, 6,000–8,500 ft.; Ruwenzori, Bwamba Pass, 5,500–7,500 ft.; Mt. Niragongwe, N. of L. Kivu, 1,900–3,000 m.; Mt. Mikeno, N. of L. Kivu, 1,900–2,400 m.; Mafugi Forest, Kigesi, 7,500–8,500 ft.; Rutenga Forest, Kigesi; Kayonza, Kigesi, 4,000 ft.; Kanaba Gap, Kigesi; Toro; Rutschuru plain; Mt. Kokajero, S.W. Elgon, 6,400 ft.; Daro or Durro Forest, Toro, 4,000–5,000 ft.; Mpanga Forest, Toro, 4,800 ft.; Mbale; Subugo Forest; Mau. RWANDA: Rugege Forest, E. of S. end of Lake Kivu. SUDAN: Lotti Forest. KENYA: Patsho, Nandi Country; Nandi Station; Nandi Plateau, 5,700–6,200 ft.; Eldoma Ravine; Escarpment, 6,500–9,000 ft.; Kipiperi, Aberdare Range, 8,000–9,000 ft.; Dabida, Rabai–Mombasa, 6,000 ft.; E. slopes, Aberdares, 7,000–8,500 ft.; Roromo, Kikuyu; Hoey's Bridge; Mt. Kenya, Meru dist. (Mt. Meru, Kenya dist.); Mara River, Masai Reserve; Nairobi, Kinangoli, 9,000 ft.; Kibwezi; Nyeri; Mbolo Hill, Voi District, 5,500 ft.; Mt. Mbololo, 5,000 ft.; Kilimanjaro, Mt. Elgon; Lumbwa, Wandanyi, 5,000 ft.; Mt. Kulal, 5,500 ft.; Mt. Marsabit. TANZANIA: Magazine Hill; Longido, W. Kilimanjaro, Ngare–Nairobi, 4,000–5,000 ft.; Mt. Rungwe, nr. N. Langenburg, 5,000–6,000 ft.; Itumba District, Meru, 8,000 ft.; Lushoto; District of Great Craters; Tukuyu. MALAWI: Mlanje Plateau, 6,000–7,000 ft.; Kasungu Mt., 7,425 ft.; Nyika Plateau. RHODESIA: Vumba (2 ♂, 1 ♀, National Museum, Bulawayo, Rhodesia); Laurenceville, 10 miles S. of Umtali (2 ♂, H. Cookson coll.); Chitora Hills, 30 miles S. of Umtali (1 ♂, H. Cookson coll.). TRANSVAAL: Woodbush (1 ♂, National Museum, Nairobi); Mariepskop, Pilgrims Rest district (1 ♂, Transvaal Museum, Pretoria); Graskop (1 ♂, Transvaal Museum, Pretoria); Haenertsburg (1 ♀, National Museum, Bulawayo. 1 ♂, 1 ♀, Transvaal Museum, Pretoria).

Distribution. A montane species occurring from about 4,000 to 13,000 feet in suitable habitats from the eastern edge of the République du Congo to Mt. Marsabit, Kenya in the north and as far south as the Transvaal. It was at first thought that the Rhodesian and Transvaal specimens might belong to a separate race, as the transverse orange band of the upperside of the fore wing is stepped at vein 1 and the dark basal area of the hind wing upperside extends into the orange marginal band along the veins, but there are similar specimens amongst those from Tanzania and Malawi and it would seem as if these southern specimens may be at the extremity of a cline.

Antanartia dimorphica aethiopica ssp. n.

(Pl. 5, figs. 34 and 35)

♂, ♀. Distinguished from the nominate subspecies by presence on the upperside of hind wing of two or three extra black spots or ocelli situated just inside the dark basal area in spaces 4–6, that in space 4 sometimes having a faint blue ocellus. In this respect it resembles *Antanartia abyssinica* (Felder), the only other species in the genus that exhibits this character; this resemblance is increased still further by the absence of tails in *abyssinica* and the very short tails in this race. Fore wing length ♂, 20–24 mm., ♀, 21–24 mm.

Holotype ♂. ETHIOPIA: Djem Djem Forest, 8,000–9,000 ft., 7–9.x.1926 (*H. Scott*).

Allotype ♀. ETHIOPIA: Dangila, 6,700 ft., 40 miles S. of Lake Tana, 3.viii.1926 (*R. E. Cheeseman*).

Paratypes: 2 ♂, same data as holotype; 2 ♂, same data as allotype; 5 ♂, 1 ♀, Abera, Djamdjam; 1 ♂, 2 ♀, Abera, S. of L. Abasa; 12 ♂, Gimera (Kaffa) to N. end of L. Rudolf; 1 ♂, Badattino, Gindeberat; 1 ♂, Dereta Mts., Kaffa; 2 ♂, Kollu (Schoa); 3 ♂, Kankati, Djimma, S.W. Abyssinia; 2 ♂, Aberasch, E. of L. Abai; 1 ♀, Arbe, S. of L. Abasa; 2 ♂, 2 ♀, Charada Forest, Kaffa, 6,000 ft.; 1 ♂, 1 ♀, Mt. Zuquala, over 9,000 ft.; Gamo Prov., Bonghé Valley; 2 ♂, Gughé Highlands, 9,500–10,000 ft.; 2 ♂, Luguala Crater, 9,000 ft.; Mt. Chillálo, *c.* 9,000 ft.; 5 ♂, 4 ♀, Scioa; 5 ♀, Scioatalit (M.S.); 1 ♂, 2 ♀, Chercher; 2 ♀, Jam-Jam; 1 ♂, Muti, 6,000–8,000 ft.

Distribution. This race is confined to the highlands of Ethiopia at altitudes up to 10,000 feet.

Rothschild & Jordan (1903 : 509) when dealing with specimens of this subspecies stated "The Abyssinian specimens of *hippomene* are all short tailed, but do not present any constant differences from East and South African ones" but that they were found to have been placed over a blank label in the Rothschild collection.

Antanartia dimorphica comoroica ssp. n.

(Pl. 5, figs. 40 and 41)

♀. Can be separated from the other subspecies by the broad orange marginal band of the upperside of hind wing, which almost obscures the indistinct and blind ocellus in space 3 and the inner submarginal black line which terminates abruptly at vein 3 and does not invade the orange band towards vein 4. There is a small white spot in space 3 of the upperside of fore wing. Fore wing length 23–25 mm.

♂. Unknown.

Holotype ♀. GRAND COMORO IS. (Rothschild Bequest).

Paratypes: 3 ♀, same data as holotype.

Distribution. This subspecies is confined to Grand Comoro Island and it is of interest that the southern *hippomene* has reached Madagascar as *madegassorum* (Aurivillius), whereas the more northern *dimorphica* has only succeeded in reaching the Comoro Islands.

Antanartia dimorphica mortoni ssp. n.

(Pl. 5, figs. 36, 37, 38 and 39)

♂, ♀. Separated from the nominate subspecies by the broader and deeper orange coloration of the transverse discal band of the fore wing of both upper and undersides, and the marginal band of hind wing upperside which is noticeably scalloped at its inner edge in some specimens. Two specimens have the band widened considerably in space 5 in the same manner as in *abyssinica*. Fore legs of male have the hairs of inner surface cream as in *hippomene*. *Upperside*. Fore wing, no small white spot in space 3 and black central cell bar stands out clearly against the rufous tone of the cell. Fore wing length ♂, 21–25 mm., ♀, 23–24 mm.

Holotype ♂. W. CAMEROONS: Mt. Cameroon. On path from Buea to Mann's Springs, 7,500–10,000 ft. In montane grassland. 30.xii.1958 (*J. K. Morton*).

Allotype ♀. NIGERIA: Obudu Plateau, 5,200 ft., 1.ii.1965 (*R. G. T. St. Leger*).

Paratypes: 9 ♂, same data as holotype (5 in J. K. Morton coll.); 3 ♂, NIGERIA: Obudu Plateau, 5,200 ft., 31.i.1965; 2 ♀, same data as allotype; 1 ♂, Bamenda Plateau (*P. J. L. Roche*). 1 ♀, W. CAMEROONS: Bamenda, iv.1919 (D. Cator coll.). 1 ♂, 2 ♀, FERNANDO PO: 3,000–4,000 ft. vi.1926 (*T. A. Barns*).

Distribution. West Cameroons, Nigeria and the island of Fernando Po.

This subspecies is named after Prof. J. K. Morton of Fourah Bay College, Freetown, Sierra Leone, who captured the first series of this insect which, when submitted for determination, was instrumental in the commencement of the present investigation.

ABNORMAL SCALING IN THE GENUS *ANTANARTIA*

During the examination of the series of this genus it was noticed that several specimens had the orange-red of the transverse bands of the upperside of the fore wings reduced in intensity and it was thought that this reduction might be due to a scale defect. This proved to be correct and as the specimens varied in degree of abnormality every specimen was examined microscopically.

Normally the scales are arranged over the wing surface with their bases towards the wing base in roughly parallel double lines running concentrically from the wing base and interspaces, each double row consisting of an upper and under layer of scales arranged alternately (see Bayard, 1932). The scales of the lower or basal layer are adpressed to the wing membrane and partially overlap each other and do not appear to be so heavily pigmented as those of the upper. The upper layer consists of slightly longer scales than the lower and overlap one another as well as covering and concealing the lower basal layer though in fact they are slightly inclined to the wing surface. In the specimens exhibiting abnormal scaling, the individual scales are rolled and twisted longitudinally to a point and in extreme cases they resemble thick hairs. Associated with this deformity is either a lack of, reduction of, or alteration to, the pigment. In all the specimens examined only the paler scales were affected, i.e. white, yellow, orange or red and none was found with the dark brown or black scales deformed. In some specimens only a few scales of one layer are affected, sometimes scattered and sometimes in small patches and in others a more general defect is present, affecting most if not all the paler scales and it is these

that are discernible to the unaided eye due to a general alteration in colour. The white scales of the apical spots of the upperside of the fore wing consist of only the basal layer and these scales seem to be the first affected when a scale defect is present in a specimen. In some examples that have the majority of the pale scales defective the scales of the white apical spots are often absent, though their sockets are present on the wing membrane denoting a transition between the two types of defect mentioned by Cockayne (1922 : 48). In general it seems as if the scales of the fore wings are affected more than those of the hind wings and the uppersides more than the undersides. In the following Table which gives the total number of specimens of each species and subspecies examined and the percentage found to have abnormal scaling, it will be seen that of the six species, *hippomene* is the most affected and *delius* the least, while *borbonica* has no defective scaling though this result may well be due to insufficient material.

Specimens of ANTANARTIA with Abnormal Scaling

	Total examined		% of abnormalities	
	♂	♀	♂	♀
delius delius	237	63	1·3	—
delius guineensis	5	—	—	—
schaeneia schaeneia	8	15	12·5	—
schaeneia dubia	142	42	2·8	9·5
schaeneia diluta	52	16	—	6·3
borbonica borbonica	13	10	—	—
borbonica mauritiana	8	5	—	—
abyssinica abyssinica	30	12	16·6	—
abyssinica jacksoni	129	42	15·5	33·3
abyssinica vansomereni	25	10	32·0	10·0
hippomene hippomene	15	20	40·0	30·0
hippomene madegassorum	4	2	—	—
dimorphica dimorphica	95	59	27·0	13·3
dimorphica aethiopica	65	23	21·5	39·1
dimorphica mortoni	5	2	—	—
dimorphica comoroica	—	3	—	—

PARALLEL MODIFICATION IN THE GENUS *ANTANARTIA*

There is a small but significant amount of parallel modification or similarity, amongst the races of the species that are sympatric. In Ethiopia particularly, the males of the subspecies of the three species that occur there—*schaeneia diluta*, *abyssinica abyssinica* and *dimorphica aethiopica*, are generally smaller and have shorter and blunter tails, if present, than elsewhere. On the upperside of the fore wings they tend to have the white subapical spots often tinged with ochre and the orange bands of both wings are slightly narrower. On the upperside of the hind wings *dimorphica aethiopica* has a series of well-defined extra spots basad of the orange marginal band very similar to those of *abyssinica abyssinica* and also the apex is clouded in a similar manner. Generally the Ethiopian races are nearer in

appearance to those from South Africa, where they occur, than to those from the central part of the African continent, i.e. *schaeneia diluta* is nearer to *schaeneia schaeneia* than to *schaeneia dubia* and *dimorphica aethiopica* is nearer to *hippomene hippomene* than to *dimorphica dimorphica*, *hippomene* being the replacement species for *dimorphica* in South Africa. In the Malagasy Republic and the Mascarene island of Réunion the two species *hippomene* and *borbonica* occur separately but are similar in pattern, shape and colour. They both have long pointed tails, very crenate wing margins and the same broad, deep orange bands on the upperside though *hippomene madegassorum* retains the normal ochre colour of the transverse band on the underside of the fore wing of the nominate race.

ACKNOWLEDGEMENTS

The author wishes to express his sincere thanks and appreciation to those colleagues in the Department of Entomology who have helped in numerous ways with this paper and to the many correspondents and specialists who have been so generous with their advice and information and for the loan of material. Particular mention must be made to Mr. N. D. Riley for reading through the manuscript and to the following : Dr. R. Agenjo (Madrid, Spain), Dr. L. A. Berger (Tervuren, Belgium), Dr. G. Bernardi (Paris, France), Mr. R. H. Carcasson (Nairobi, Kenya), Messrs. H. & D. M. Cookson (Umtali, Rhodesia), Mr. C. G. Dickson (Cape Town, South Africa), Dr. R. M. Fox (Pittsburg, U.S.A.), Mr. T. H. E. Jackson (Kitale, Kenya), Dr. P. Malzy (Tananarive, Malagasy Rep.), Prof. J. K. Morton (Freetown, Sierra Leone), Mr. K. M. Pennington (Balgowan, Natal), Dr. E. Pinhey (Bulawayo, Rhodesia), Dr. P. J. L. Roche (London, England), Mr. R. G. T. St. Leger (Enugu, Nigeria), Dr. V. G. L. van Someren (Ngong, Kenya), Dr. G. van Son (Pretoria, South Africa), Dr. P. Viette (Paris, France), Mr. B. K. West (Dartford, England).

REFERENCES

Aurivillius, C. 1898. Rhopalocera Aethiopica. Die Tagfalter des Aethiopischen Faunengebietes. *K. svenska VetenskAkad. Handl.* **31** (5) : 1–561, 6 pl.

—— In Seitz, A., 1913, *The Macrolepidoptera of the World.* **13**, 613 pp., 80 pl. Stuttgart.

Bayard, A. 1932. Observations élémentaires sur les ecailles des Lépidoptères. *Bull. Soc. fr. Microsc.* **1** (3) : 61–67.

Boisduval, J. B. A. D. de. 1833. Mémoire sur les Lépidoptères de Madagascar, Bourbon et Maurice. *Nouv. Annls Mus. Hist. nat., Paris* **2** (3) : 149–270, 7 pl.

Boorman, J. & Roche, P. 1959. *The Nigerian Butterflies.* Part 5. *Nymphalidae.* (3) 19 pp , 47 pl. Ibadan, Nigeria.

Butler, A. G. 1880. On a collection of Lepidoptera from Madagascar, with descriptions of new Genera and Species. *Ann. Mag. nat. Hist.* **5** (5) : 333–343.

Cockayne, E. A. 1921. Structural abnormalities in Lepidoptera. *Lond. Nat.* 10–69, 1 pl.

Diakonoff, A. 1954. Considerations on the terminology of the genitalia of Lepidoptera. *Lepid. News* **8** : 67–74. 2 figs.

Drury, D. 1782. *Illustrations of Natural History of Exotic Insects* **3**. 18 pl. London.

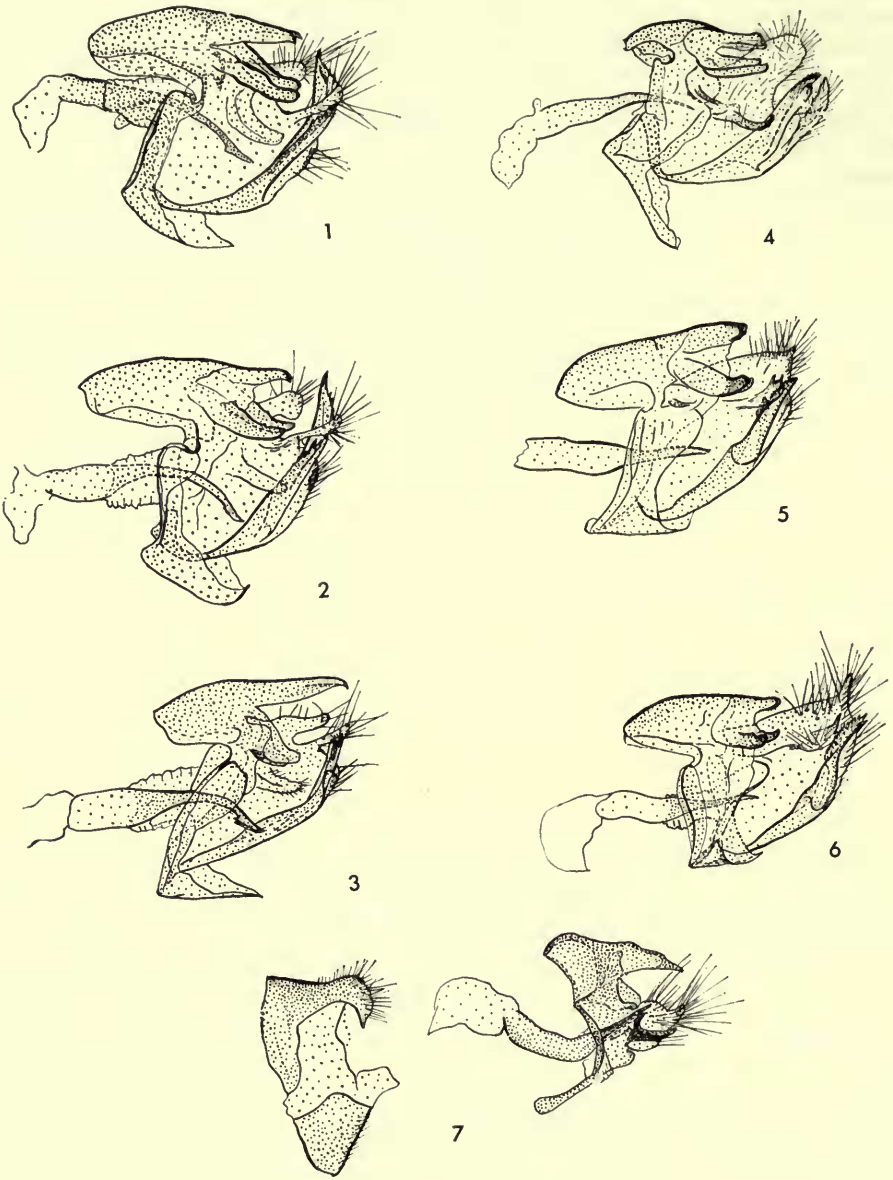
Dufrane, A. 1945. Lépidoptères du Kivu. *Bull. Soc. ent. Belg.* **81** : 90–143.

Fabricius, J. C. 1793. *Entomologia Systematica.* **3**. 487 pp. Hafniae.

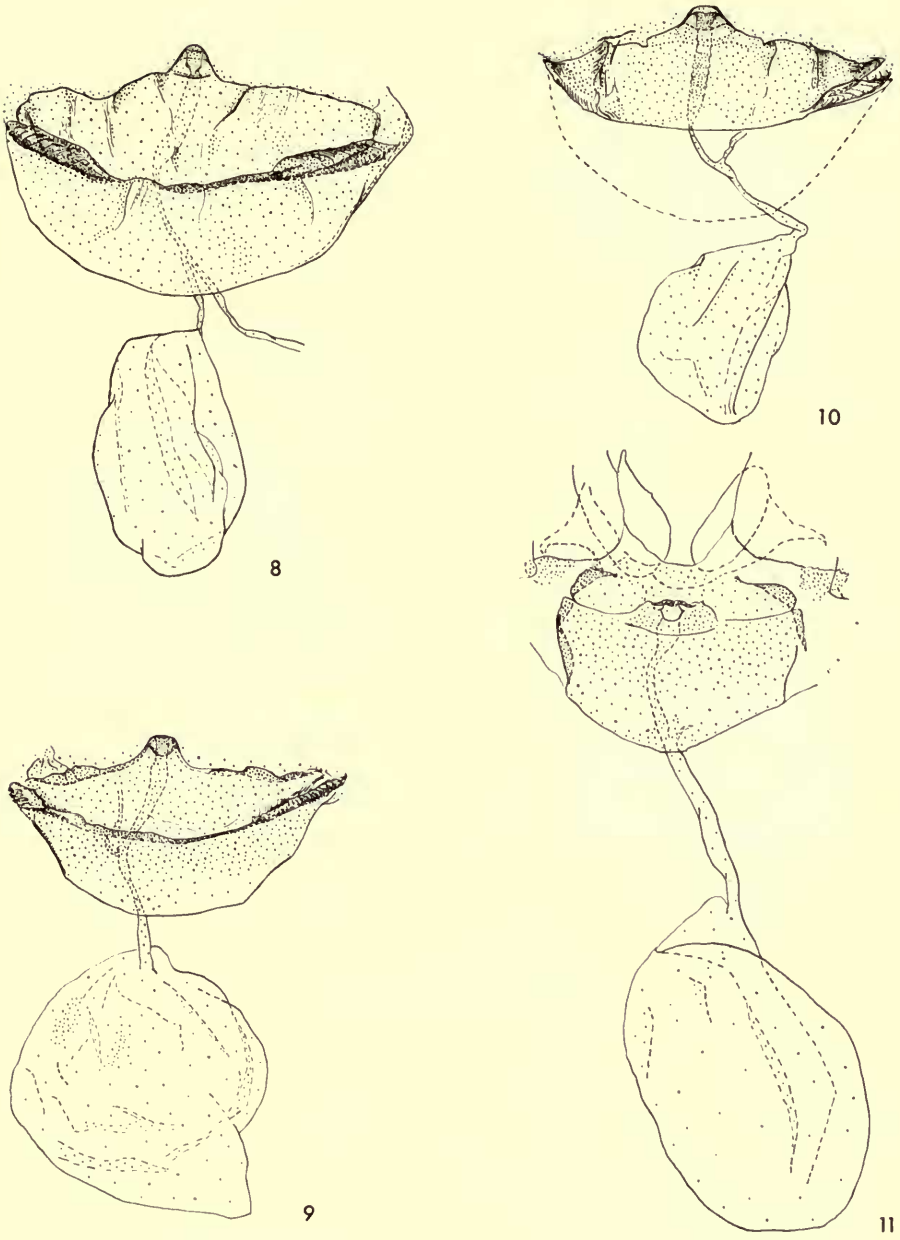
Felder, C. & R. 1867. *Reise Novara.* **3** : 379–535. 27 pl. Wien.

Godart, J. B. 1819. *Encyclopédie Méthodique, Histoire Naturelle.* **9** : 828 pp. Paris.

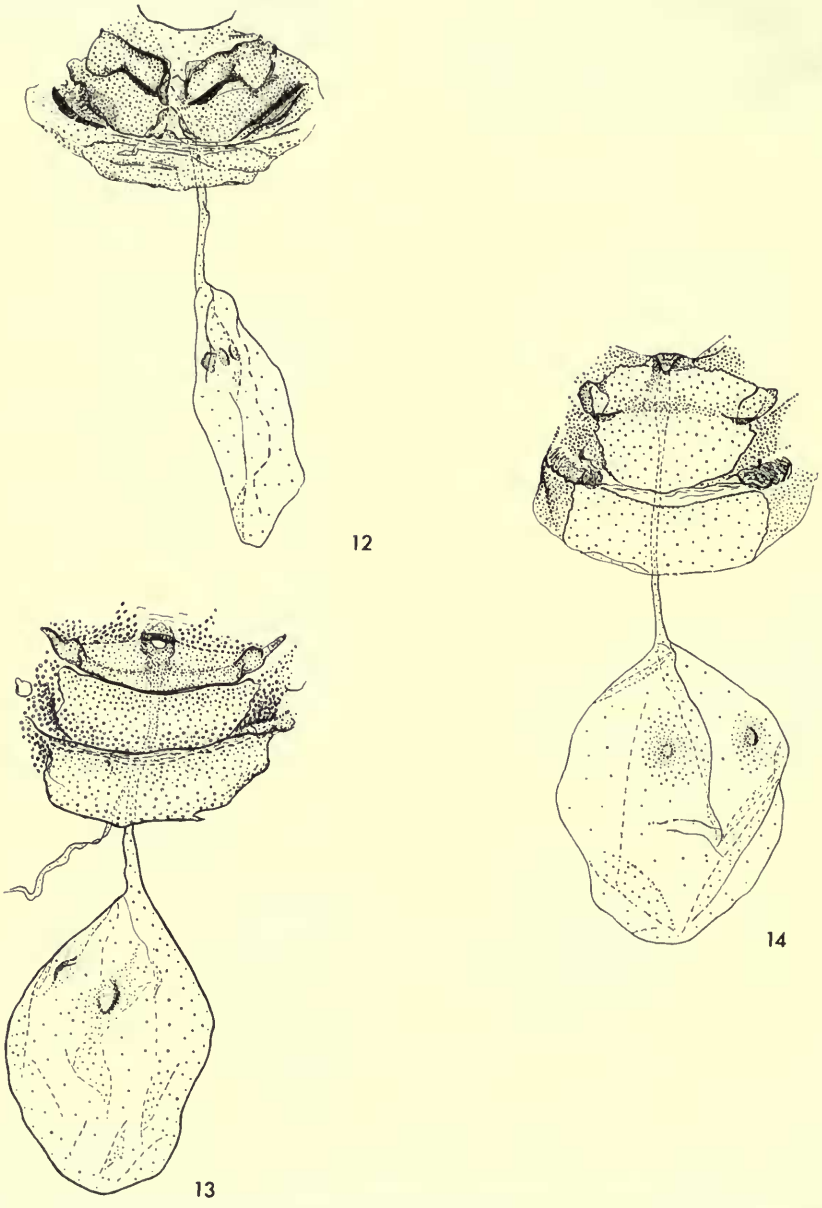
HÜBNER, J. 1823. *Sammlung exotischer Schmetterlinge*. **2**. 225 pl.
MANDERS, N. 1908. The butterflies of Mauritius & Bourbon. *Trans. ent. Soc. Lond.* **4** : 429–454. pl. 29.
OBERTHÜR, C. 1880. Spedizione Italiana nell' Africa Equatoriale–Lepidotteri dello Scioa. Part 1. *Annali Mus. civ. Stor. nat. Giacomo Doria* **15** : 129–186, pl. 1.
—— 1883, ditto, Part 2. **18** : 709–740, pl. 9.
ROTHSCHILD, W. & JORDAN, K. 1903. Lepidoptera collected by Oscar Neumann in North-East Africa. *Novit. zool.* **10** : 491–542.
SHARPE, E. M. 1904. Descriptions of new Lepidoptera from Equatorial Africa. *Entomologist.* **37** : 181–183.
SUFFERT, E. 1904. Neue Nymphaliden aus Africa. *Dt. ent. Z. Iris.* **17** : 108–123.
SWANEPOEL, D. A. 1953. *Butterflies of South Africa.* 320 pp. 17 pl. Cape Town.
TRIMEN, R. 1862. *Rhopalocera Africae australis* **1** : 1–190. 1 pl. Cape Town.
—— 1879. On some hitherto undescribed butterflies inhabiting South Africa. *Trans. ent. Soc. Lond.* **4** : 323–345.
—— 1887. *South African Butterflies.* **1**. 355 pp. 6 pl. London.



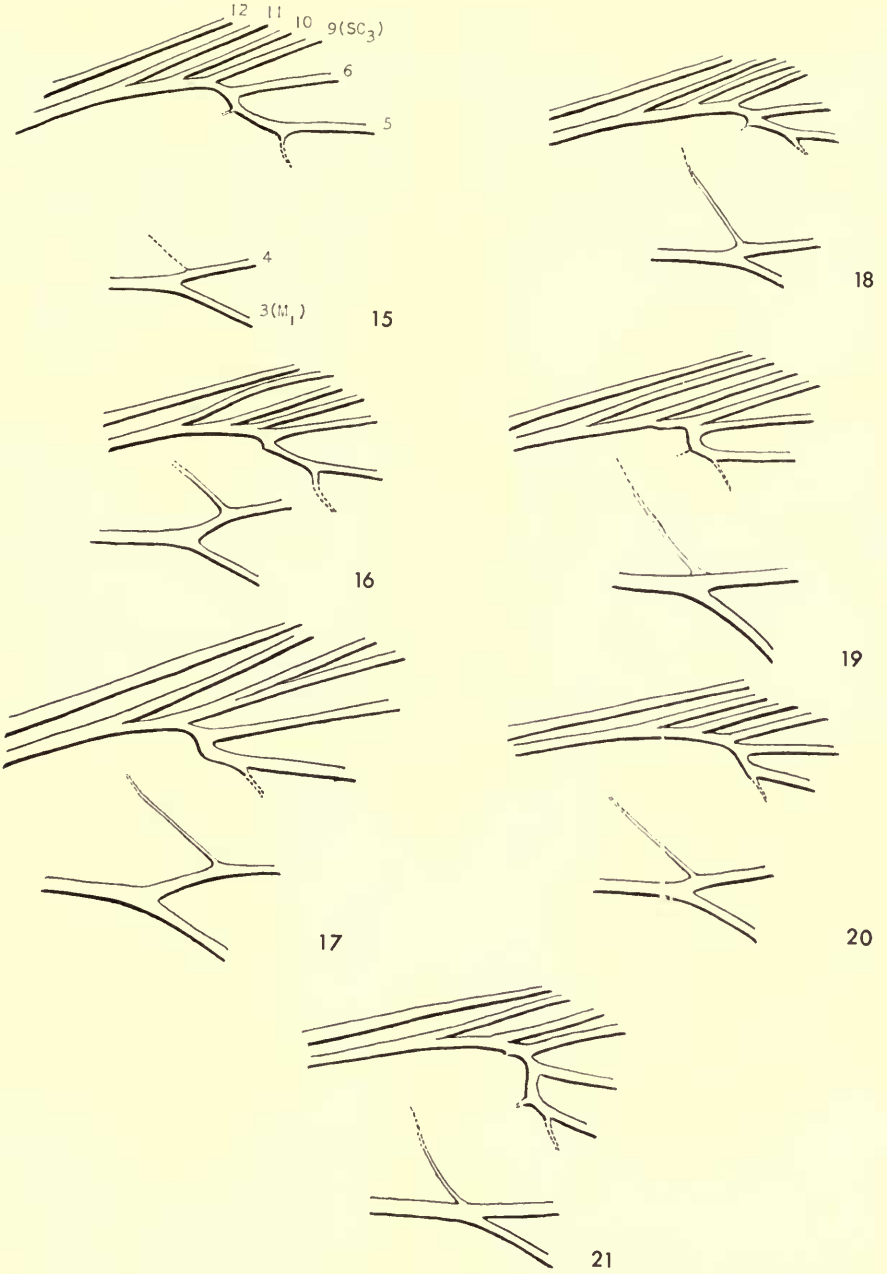
FIGS. 1–7. Male genitalia of *Antanartia* Rothschild & Jordan and *Hypanartia* Hübner with left-hand valva removed. 1, *Antanartia delius* (Drury) ; 2, *A. schaeneia* (Trimen) ; 3, *A. borbonica* (Oberthür) ; 4, *A. abyssinica* (Felder) ; 5, *A. hippomene* (Hübner) ; 6, *A. dimorphica* sp. n. ; 7, *Hypanartia kefersteini* (Doubleday & Hewitson) with the eighth abdominal tergite and superuncus.



FIGS. 8–11. Female genitalia of *Antanartia* Rothschild & Jordan. 8, *Antanartia delius* (Drury); 9, *A. schaeneia* (Trimen); 10, *A. delius* × *schaeneia* hybrid (?); 11, *A. borbonica* (Oberthür).



FIGS. 12–14. Female genitalia of *Antanartia* Rothschild & Jordan. 12, *Antanartia abyssinica* (Felder); 13, *A. hippomene* (Hübner); 14, *A. dimorphica* sp. n.



FIGS. 15–21. Venation of *Antanartia* Rothschild & Jordan and *Hypanartia* Hübner: Upper. Area adjacent to the upper apex of the discoidal cell of fore wing. Lower. Discocellular area adjacent to veins 3 and 4 of hind wing. 15, *Antanartia delius* (Drury); 16, *A. schaeneia* (Trimen); 17, *A. borbonica* (Oberthür); 18, *A. abyssinica* (Felder); 19, *A. hippomene* (Hübner); 20, *A. dimorphica* sp. n.; 21, *Hypanartia kefersteini* (Doubleday & Hewitson).

PLATE 1

Upper and undersides of *Antanartia* Rothschild & Jordan

FIG. 1. *Antanartia delius delius* (Drury), ♂ Cameroons. Photos. Brit. Mus. (N.H.) Nos. 37294, 37295. FIG. 2. *A. delius delius* (Drury), ♀ Sierra Leone. Photos. Brit. Mus. (N.H.) Nos. 37296, 37297. FIG. 3. *A. delius delius* (Drury), ♂ S. Sudan. Photos. Brit. Mus. (N.H.) Nos. 37300, 37301. FIG. 4. *A. delius delius* (Drury), ♀ Kenya. Photos. Brit. Mus. (N.H.) Nos. 37302, 37303. FIG. 5. *A. delius delius* f. *amauroptera* Sharpe, ♂ Kenya. Photos. Brit. Mus. (N.H.) Nos. 37304, 37305. FIGS. 6 and 7. *A. delius guineensis* ssp. n. Holotype ♂, Fernando Po. Photos. Brit. Mus. (N.H.) Nos. 37298, 37299.

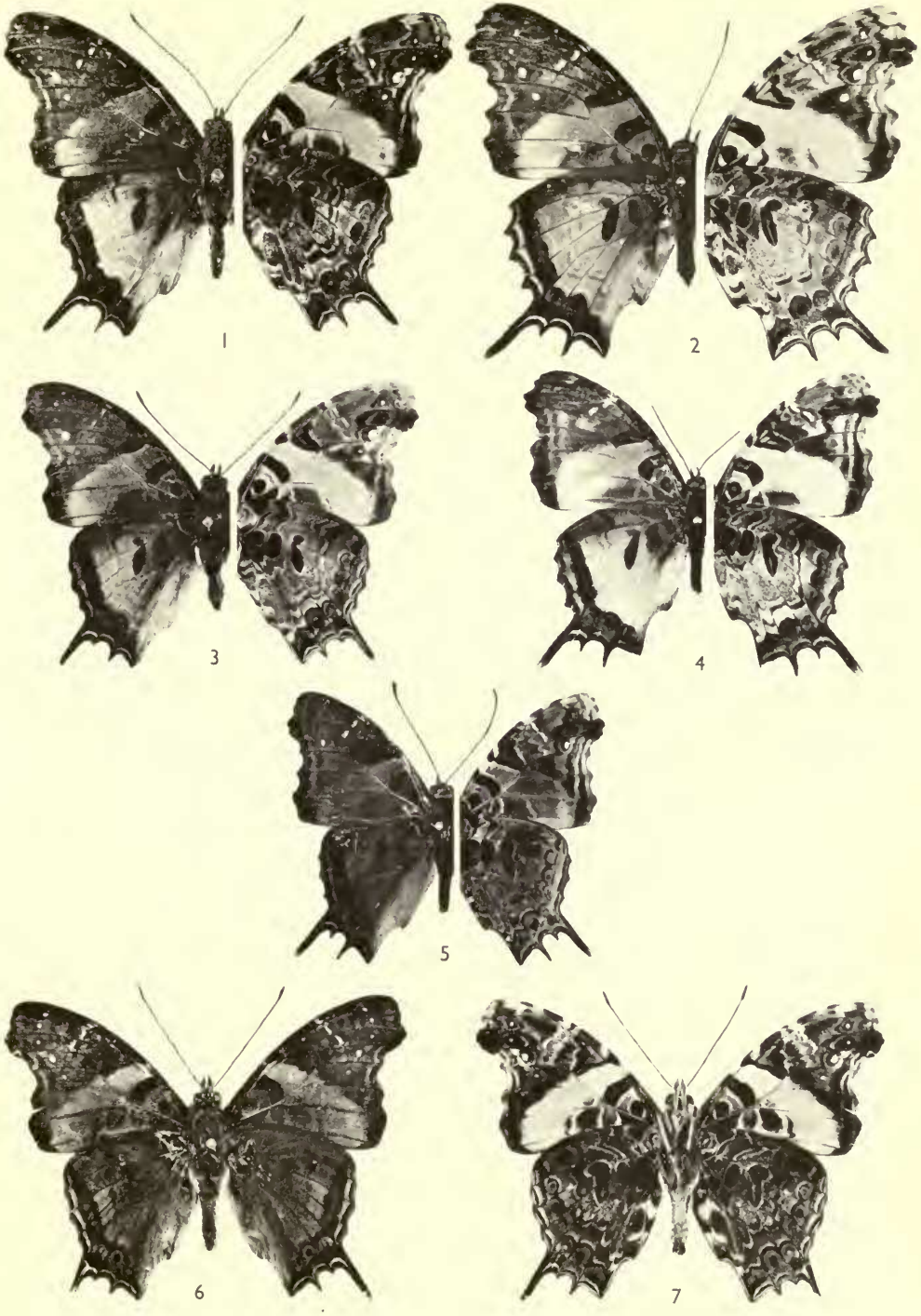
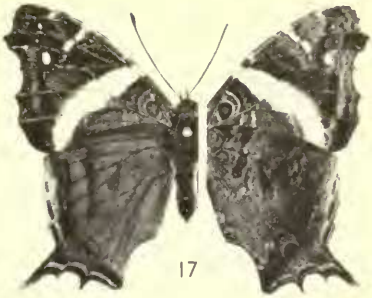

1
2
3
4
5
6
7

PLATE 3

Upper and undersides of *Antanartia* Rothschild & Jordan

FIGS. 16, 17. *Antanartia schaeneia diluta* Rothschild & Jordan ♂ and ♀ respectively, Ethiopia. Photos. Brit. Mus. (N.H.) Nos. 37314, 37315, 37316, 37317. FIG. 18. *A. borbonica borbonica* (Oberthür), ♂, Réunion. Photos. Brit. Mus. (N.H.) Nos. 37346, 37347. FIG. 19. *A. borbonica mauritiana* Manders, Paratype ♂, Mauritius. Photos. Brit. Mus. (N.H.) Nos. 37318, 37319. FIG. 20. *A. abyssinica abyssinica* (Felder), ♂, Ethiopia. Photos. Brit. Mus. (N.H.) Nos. 37320, 37321. FIG. 21. *A. abyssinica jacksoni* ssp. n., Paratype ♂, Kenya. Photos. Brit. Mus. (N.H.) Nos. 37322, 37323. FIGS. 22 and 23. *A. abyssinica vansomereni* ssp. n. Holotype ♂, N.W. Kivu. Photos. Brit. Mus. (N.H.) Nos. 37324, 37325. FIG. 24. *A. hippomene hippomene* (Hübner), ♂, Natal. Photos. Brit. Mus. (N.H.) Nos. 37326, 37327. FIG. 25. *A. hippomene hippomene* (Hübner), ♀, S. Africa. Photos. Brit. Mus. (N.H.) Nos. 37328, 37329.


16


17

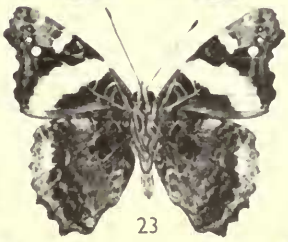

18

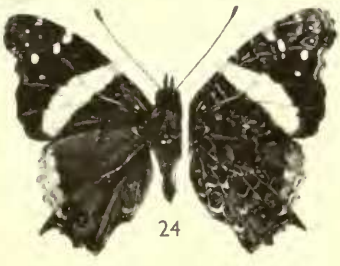

19


20


22


21


23

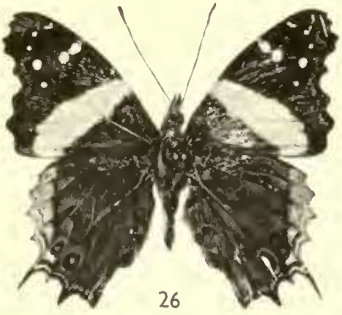

24


25

PLATE 4

Upper and undersides of *Antanartia* Rothschild & Jordan

FIGS. 26, 27. *Antanartia hippomene madegassorum* (Aurivillius), ♂ Madagascar. Photos. Brit. Mus. (N.H.) Nos. 37330, 37331. FIGS. 28, 29, 30, 31. *A. dimorphica dimorphica* sp. n., Holotype ♂ and Allotype ♀ respectively, Uganda. Photos. Brit. Mus. (N.H.) Nos. 37336, 37337, 37338, 37339. FIGS. 32, 33. *A. dimorphica dimorphica* sp. n. Paratype ♂ and ♀ respectively, Rhodesia. Photos. Brit. Mus. (N.H.) Nos. 37342, 37343, 37344, 37345.



26

27

28

29

30

31

32

33

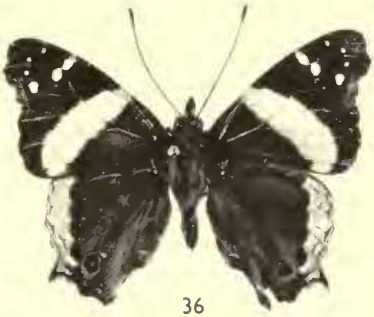
PLATE 5

Upper and undersides of *Antanartia* Rothschild & Jordan

FIGS. 34, 35. *Antanartia dimorphica aethiopica* ssp. n., Holotype ♂, Ethiopia. Photos, Brit. Mus. (N.H.) Nos. 37340, 37341. FIGS. 36, 37. *A. dimorphica mortoni* ssp. n., Paratype ♂. Cameroon, Photos. Brit. Mus. (N.H.) Nos. 37334, 37335. FIGS. 38, 39. *A. dimorphica mortoni* ssp. n., Allotype ♀, Nigeria. Photos. Brit. Mus. (N.H.) Nos. 37400a, 37401a. FIGS. 40, 41. *A. dimorphica comoroica* ssp. n., Holotype ♀, Comoro Is. Photos. Brit. Mus. (N.H.) Nos. 37332, 37333.

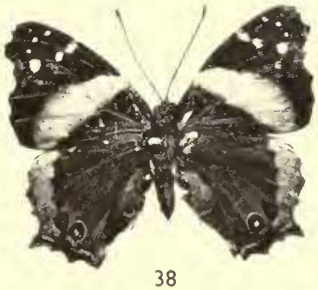
34

35



36

37



38

39

40

41